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10/030,502	05/14/2002	Olli Salmela	4925-193PUS	2169

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EXAMINER

LEE, BENNY T

ART UNIT

PAPER NUMBER

2817

DATE MAILED: 06/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.



## Patent and Trademark Office

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SERIAL NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.

EXAMINER	
ART UNIT	PAPER NUMBER
	8

DATE MAILED:

This is a communication from the examiner in charge of your application.

COMMISSIONER OF PATENTS AND TRADEMARKS

☒ This application has been examined ☒ Responsive to communication filed on 8 Jan 10 2007 ☐ This action is made final.

A shortened statutory period for response to this action is set to expire Three (3) month(s), 88 days from the date of this letter.  
Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

## Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

- |  |   |
|--|---|
| 1. <input type="checkbox"/> Notice of References Cited by Examiner, PTO-892.       | 2. <input type="checkbox"/> Notice re Patent Drawing, PTO-948.                  |
| 3. <input checked="" type="checkbox"/> Notice of Art Cited by Applicant, PTO-1449  | 4. <input type="checkbox"/> Notice of Informal Patent Application, Form PTO-152 |
| 5. <input type="checkbox"/> Information on How to Effect Drawing Changes, PTO-1474 | 6. <input type="checkbox"/> _____   |

## Part II SUMMARY OF ACTION

1. ☒ Claims 1-7 are pending in the application.

Of the above, claims \_\_\_\_\_ are withdrawn from consideration.

2. ☐ Claims \_\_\_\_\_ have been cancelled.

3. ☐ Claims \_\_\_\_\_ are allowed.

4. ☒ Claims 1, 2; 3-7 are rejected.

5. ☐ Claims \_\_\_\_\_ are objected to.

6. ☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

7. ☐ This application has been filed with informal drawings which are acceptable for examination purposes until such time as allowable subject matter is indicated.

8. ☐ Allowable subject matter having been indicated, formal drawings are required in response to this Office action.

9. ☐ The corrected or substitute drawings have been received on \_\_\_\_\_. These drawings are: ☐ acceptable;  
☐ not acceptable (see explanation).

10. ☐ The ☐ proposed drawing correction and/or the ☐ proposed additional or substitute sheet(s) of drawings, filed on \_\_\_\_\_ has (have) been ☐ approved by the examiner. ☐ disapproved by the examiner (see explanation).

11. ☐ The proposed drawing correction, filed \_\_\_\_\_, has been ☐ approved. ☐ disapproved (see explanation). However, the Patent and Trademark Office no longer makes drawing changes. It is now applicant's responsibility to ensure that the drawings are corrected. Corrections MUST be effected in accordance with the instructions set forth on the attached letter "INFORMATION ON HOW TO EFFECT DRAWING CHANGES", PTO-1474.

12. ☒ Acknowledgment is made of the claim for priority under 35 U.S.C. 119. The certified copy has ☒ been received ☐ not been received  
☐ been filed in parent application, serial no. \_\_\_\_\_; filed on \_\_\_\_\_

13. ☐ Since this application appears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.

14. ☐ Other

SN 30502

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The disclosure is objected to because of the following informalities: Page 4, in the brief description of "Fig. 1", should --prior art-- follow "ordinary"? Page 5, in the replacement paragraph to page 5, line 15, note that "PRESENTLY" should be deleted as being unnecessary. Page 7, lines 19, 27, note that --(not shown in Fig. 4)-- should follow each occurrence of "plane".

Appropriate correction is required.

The disclosure is objected to because of the following informalities: Note that the following reference labels appearing in the corresponding drawings need explicit description therewith: figs. 2, 3 ("E<sub>r</sub>" for the core region); fig. 4 ("E<sub>r</sub>" for the strip lines); figs. 5a-5c, 6a, 6b ("E<sub>r</sub>" in general); fig. 6a (G, S,  $\lambda/4$ , 65a); fig. 6b (64b, 65b,  $\lambda/4$ ).

Appropriate correction is required.

The drawings are objected to because of the following: note that "Fig. 1" should be labeled --PRIOR ART--; In Figs. 2, 3, all dielectric materials should be properly cross-hatched. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claims 1, 2; 3-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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In claims 1, 3, note that “the multilayer ceramic technique” lacks strict antecedent basis. Note that it is unclear, even in light of the specification, as to what characterizes “structural directions”. Note that it is unclear relative to what feature is “the permittivity  $\epsilon_r$  of which ...” is associated.

In claim 3, note that it is unclear which one of the plural “circuit units” is intended by the recitation of “the circuit unit”.

In claims 5, 6, 7, note that “in first surface of the waveguide” lacks strict antecedent basis.

The following claims have been found objectionable for reasons set forth below:

At all appropriate occurrences throughout the claims, should “which” be rewritten as --said-- for clarity?

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1; 3 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by the EP (‘123) publication (cited by applicants’).

The EP (‘123) publication (Fig. 1) discloses a waveguide integrated into circuit units by laminating multiple ceramic layers (1) such that the composite structure includes a high-dielectric constant “core” portion (3) extending in a longitudinal (i.e. a “z”) direction. The “core” also includes cross-sectional dimensions (i.e. horizontal or “x” direction and a vertical or “y”

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direction. Note that adjacent the edges of the “core” portion (3) are low-dielectric constant portions (4). As described with respect to Fig. 1, the high-dielectric constant portion (3) serves as the wave propagating area while the adjacent low-dielectric constant portions (4) do not function as a wave propagating area. Accordingly, the interface between the “core” portion (3) and the low-dielectric constant portions (4) inherently define “discontinuities” along these interface (i.e. the y-z plane) thereby limiting the “x” or horizontal dimension of “core” portion (3). Moreover, note that the low-dielectric constant portion (4) includes air filled vias or “cavities” disposed therein to provide for the low dielectric constant nature of portion (4) which in turn aids in forming the “discontinuities” at the interfaces with propagating “core” portion (3). Furthermore, note that planar conductive electrode films (5) cover the “core” portion (3) at top and bottom regions thereof along the x-z plane of the waveguide structure, thereby limiting the y or vertical dimension of the “core” portion (3).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any

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evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103© and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 2; 4, 5, 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over the EP ('123) publication in view of the EP ('328) publication (both cited by applicants').

As disclosed in the EP ('123) publication, note that in the EP ('123) publication, the air cavities or vias include ones which inherently are oriented along the interface (i.e. y-z planes). However, the EP ('123) publication does not disclose the "core" portion having y-axis oriented conductive via-holes and does not disclose the use of a hole and probe waveguide excitation system.

As disclosed in the EP ('328) publication, at fig. 1 thereof, a dielectric waveguide includes a high-dielectric constant propagating region (5) which is electrically isolated from adjacent non-propagating regions by rows of conductive vias (4) aligned along the longitudinal/propagating direction of the propagating region (5). Moreover, as disclosed with respect to Figs. 5 and 6, signal coupling is effected by a hole in upper conductive layer (2) through which a probe/antenna (52/62) protrudes through to propagate signal energy in propagating region (5).

Accordingly, it would have been obvious in view of the references, taken as a whole to have: 1) added conductive vias along the interface of the "core" region of the EP ('123)

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publication; and 2) provide a hole and coupling probe as the waveguide coupling structure in the EP ('123) publication.

Such modifications would have been obvious since:

1) the addition of conductive vias along the propagating/non-propagating interface of the EP ('123) publication would have provided the advantageous benefit of additional isolation between the propagating "core" (3) and the non-propagating portion (4) in the EP ('123) publication, thereby suggesting the obviousness of such a modification; and 2) the generic nature of the waveguide coupling in the EP ('123) publication would have been suggested that any equivalent waveguide coupling (i.e. a hole and probe coupling as taught by the EP ('328) publication) would have been usable therewith, thereby suggesting the obviousness of such a combination.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over the EP ('123) publication (cited by applicants') in view of King.

As described above, the EP ('123) publication meets the claimed invention except for the loop probe extending through a hole in the waveguide.

King (fig. 40) discloses that the use of loop probes passing through a hole in a waveguide is conventional in the art.

Accordingly, it would have been obvious in view of the references, taken as a whole, to have provided a loop probe waveguide coupling as taught by King as the waveguide coupling in the EP ('123) publication. Such a modification would have been obvious since the generic nature of the waveguide coupling in the EP ('123) publication would have suggested that any

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equivalent waveguide coupling (i.e. the loop probe in King) would have been usable, thereby suggesting the obviousness of such a modification.

Any inquiry concerning this communication should be directed to Benny Lee at telephone number 308-4902.

A handwritten signature in cursive script that reads "Benny Lee".

BENNY T. LEE  
PRIMARY EXAMINER  
ART UNIT 2817

Lee/ek

06/04/03